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(71) Applicant(s):
Anthony Lambert
8 Russell Avenue, Hartley, PLYMOUTH, PL5 3RA, United Kingdom

(72) Inventor(s):
Anthony Lambert

(74) Agent and/or Address for Service:
K R Bryer & Co
7 Gay Street, BATH, BA1 2PH,
United Kingdom

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A61B 17/00

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A5R REYJ

(56) Documents Cited:

GB 1546172 A	**RU 002146880 C**
SU 001801374 A	**SU 001337066 A**
SU 000664640 A	**US 5192298 A**

(58) Field of Search:
UK CL (Edition V) **A5R**
INT CL[7] **A61B, A61M**
Other: **Online: EPODOC, WPI & PAJ.**

(54) Abstract Title: **Subcutaneous orchidopexy tunneller for moving a testicle down in to the scrotumin cases of cryptorchidism**

(57) An orchidopexy tunneller, used for moving an undescended testicle down in to the scrotum in cases of cryptorchidism, comprises an elongated body 12 having, at one end an attachable/detachable head 14 (the size of which is selected so as to correspond with testicle size), and at the other end a ring-shaped attachment means 16 which is attached to the undescended testicle via a stitch. Elements 14 and 16 are attached to body 12 via threaded interengagement. During operation, a insertion is made above the undescended testicle and it is attached to attachment means 16. A small insertion is also made in the base of the scrotum in to which the testicle is to be moved. Head 14 is inserted through the first insertion and out through the scrotal insertion, moving the undescended testicle in to the scrotum. Engagement means comprising a forceps type instrument are also disclosed as is an associated kit of parts.

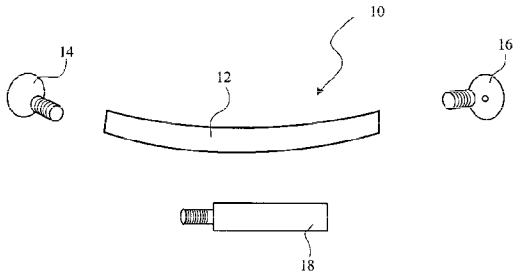

Fig. 1

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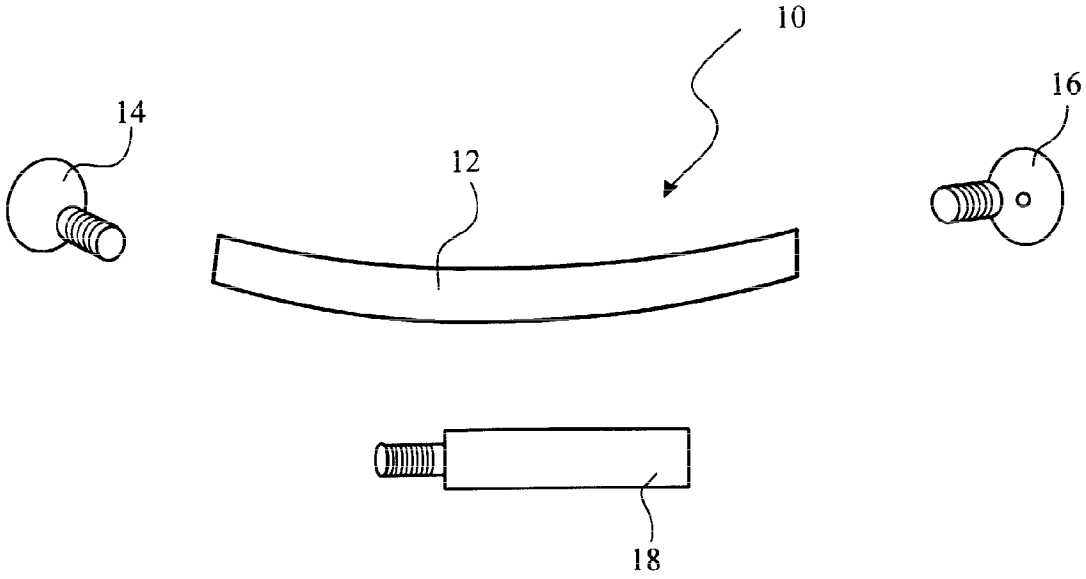

Fig. 1

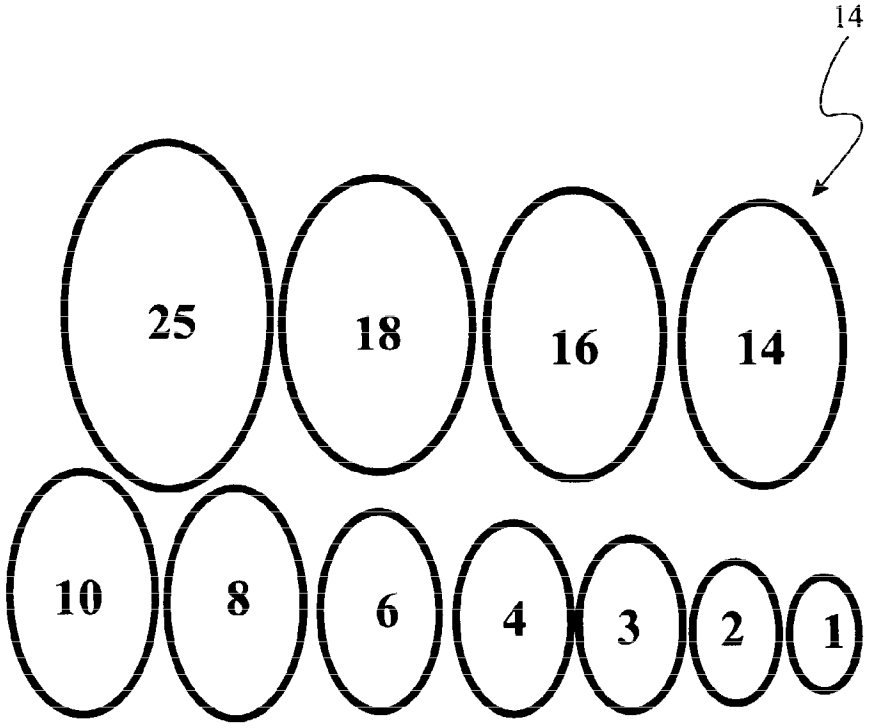

Fig. 2

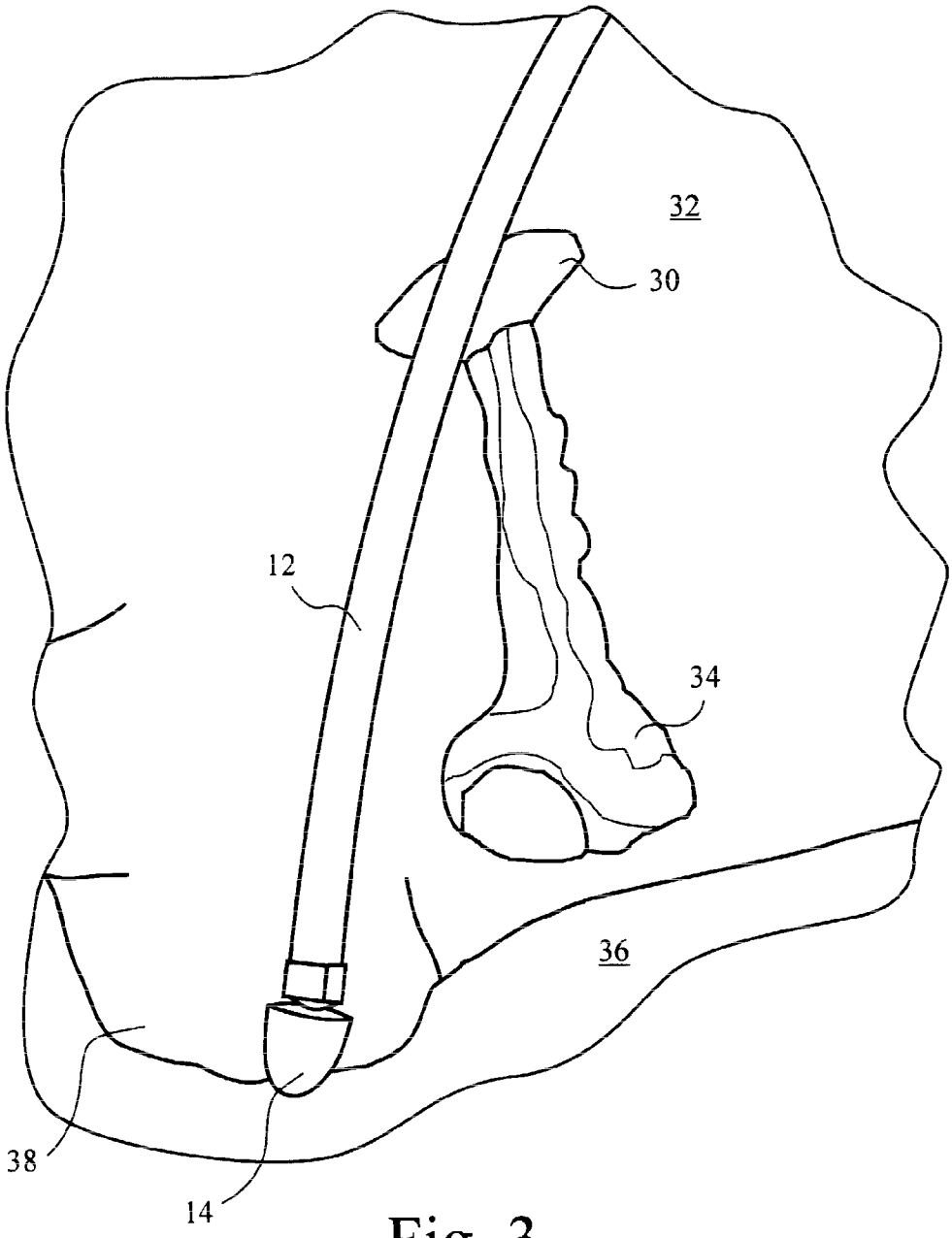

Fig. 3

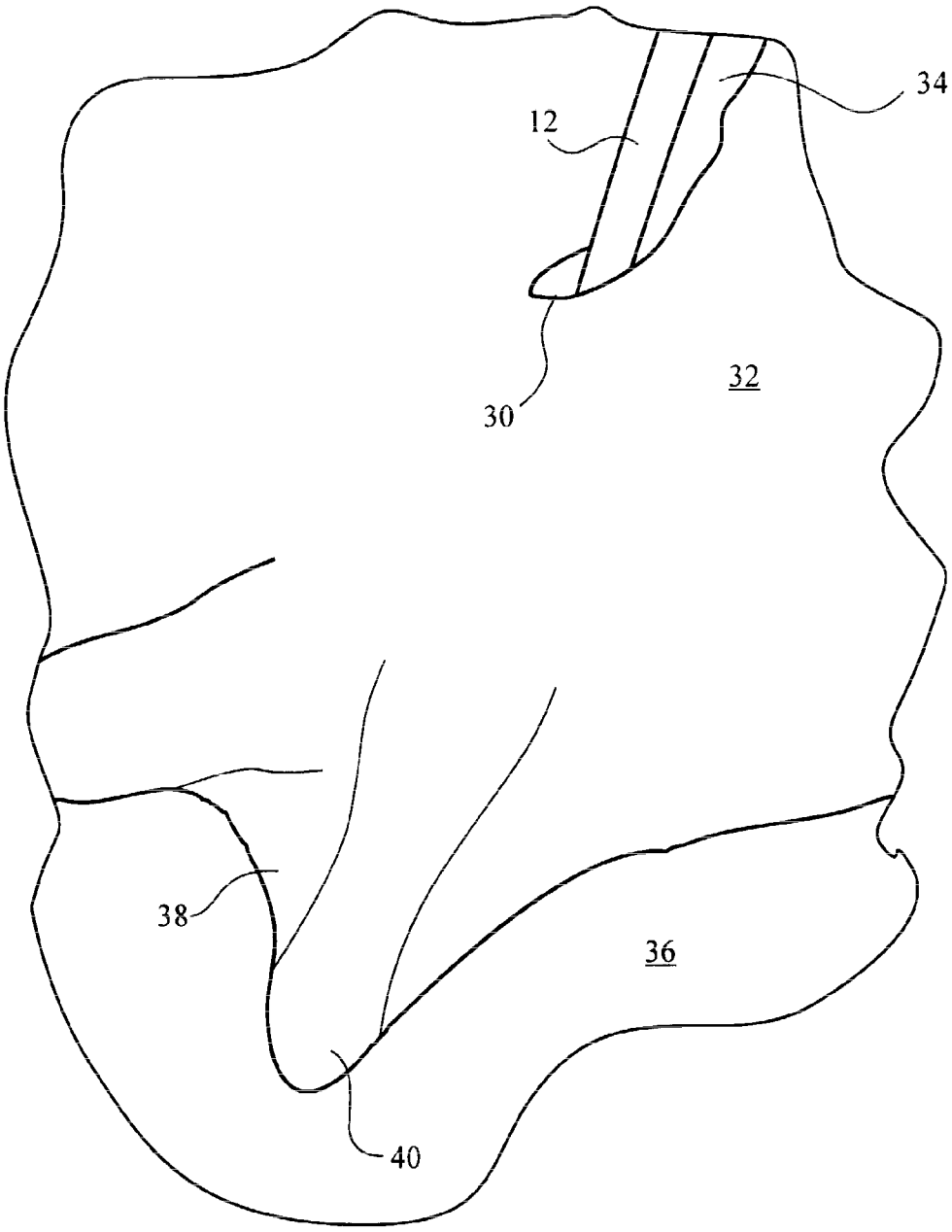

Fig. 4

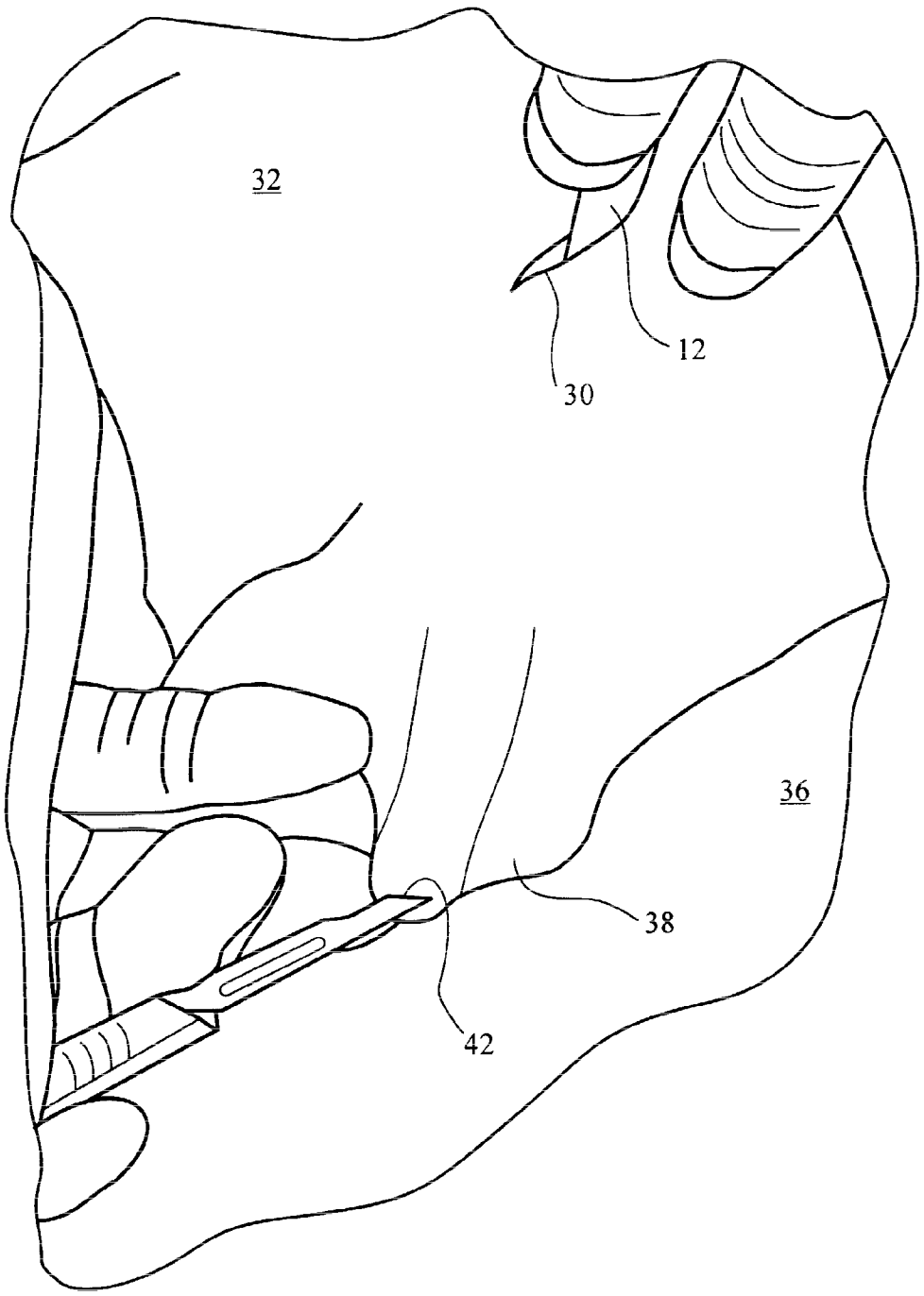

Fig. 5

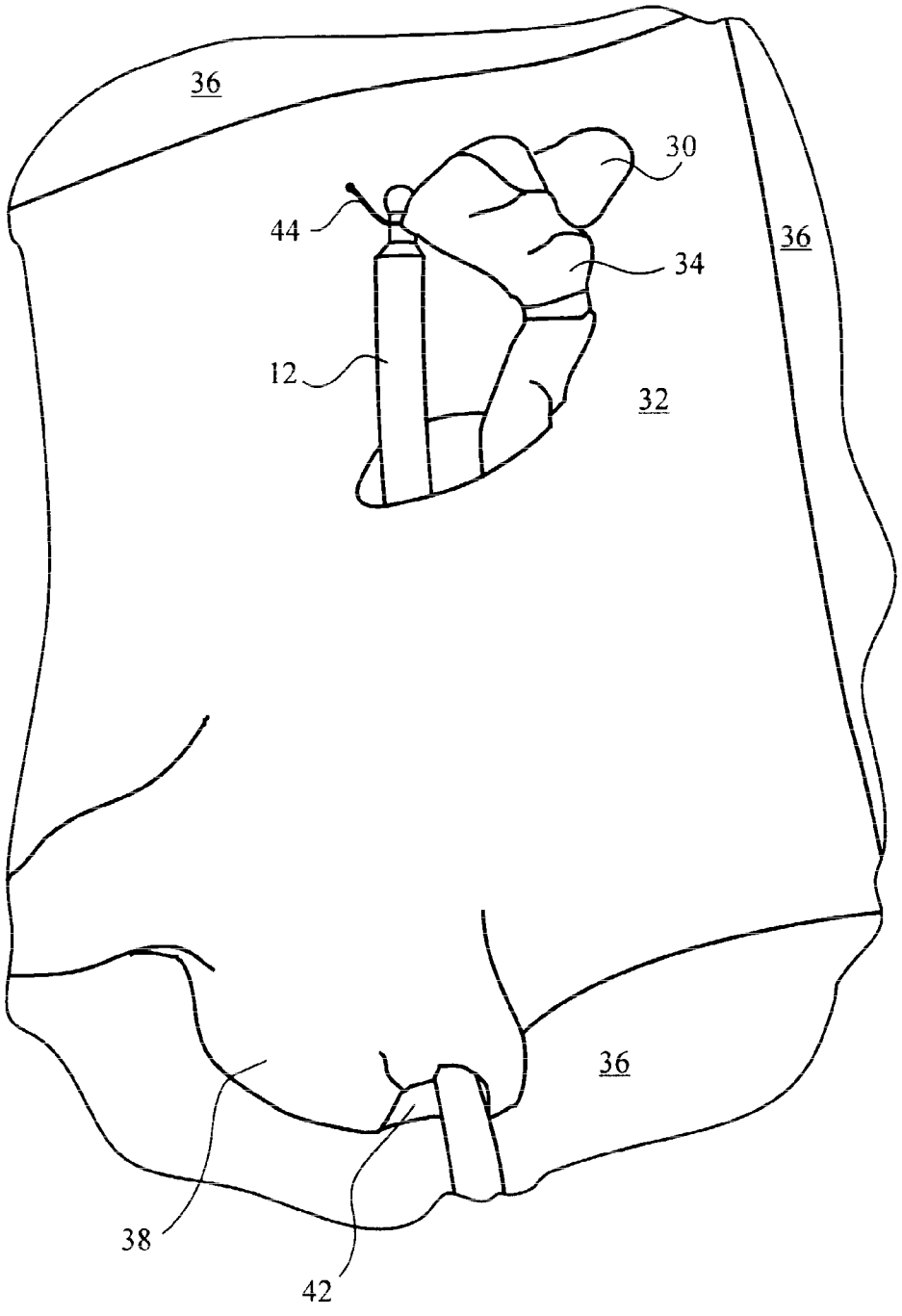

Fig. 6

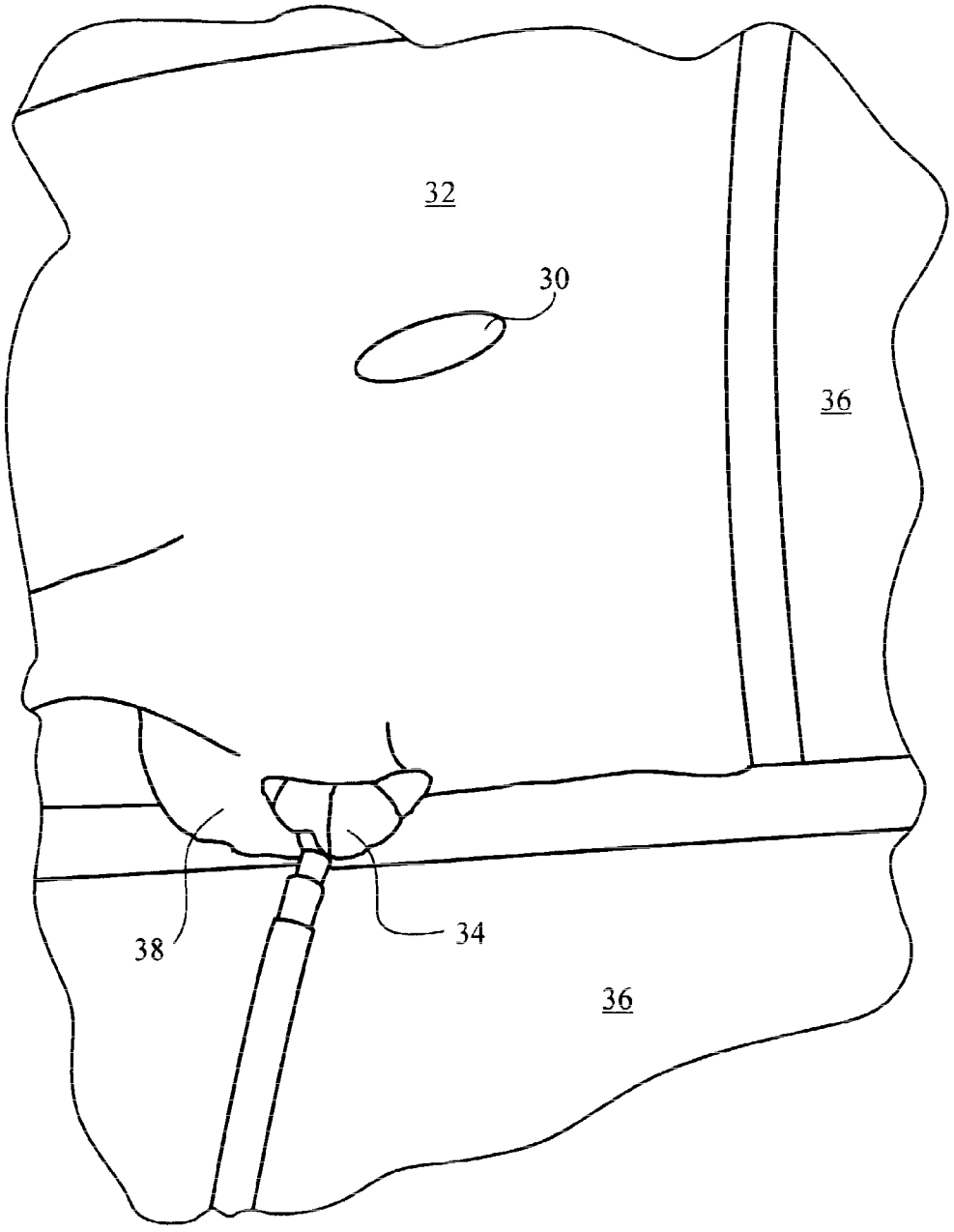

Fig. 7

SUBCUTANEOUS TUNNELLER

This invention relates to subcutaneous surgical tunnellers and in particular concerns a tunneller suitable for use in orchidopexy surgery to correct undescended testis in the human male body.

Cryptorchism (undescended testis) is a congenital condition where one or more testis fail to descend from the abdominal cavity into the scrotal sac. If left untreated this condition can result in an increased risk of testicular cancer. The condition is corrected using orchidopexy surgery often using standard operating laparoscope surgical instruments, first to dissect and immobilise the undescended testis with respect to the abdominal wall and then to grasp the testis and apply caudal traction to aid in dissection and move the testis into the scrotum so that it may be anchored in a subcutaneous scrotal pouch (dartos pouch). This procedure can involve a minimum of invasive surgery.

There is a requirement to simplify current surgical procedures so that trauma of the surrounding tissue is minimised and also to provide a quicker and more reliable procedure using the minimum of invasive instruments.

According to an aspect of the invention there is provided an orchidopexy tunneller comprising an elongate body having a connection means at a one end thereof for connecting an attachable/detachable tunnelling head selected from a set of different

sized heads each corresponding to a different testis size, and attachment means at the opposite end thereof for attachment with a testis to be repositioned in the human body by the said tunneller during orchidopexy surgery.

The orchidopexy tunneller of the present invention readily enables orchidopexy surgery to be undertaken by creating an incision in the abdominal cavity in the region of the undescended testis, inserting the tunneller in the incision so formed and feeding the tunneller subcutaneously to the scrotum so that the tunneller head creates a dartos pouch for later anchoring the undescended testis within the scrotum. A further incision can then be made in the scrotum so that the tunneller head can be fed through the scrotum and out of the patient's body until the other end of the tunneller is positioned in the region of the first incision where the undescended testis is attached to that end of the tunneller so that further movement of the tunneller through the abdominal cavity and scrotum applies caudal traction so that the testis follows the end of the tunneller into the scrotum where the testis can be detached from the end of the tunneller and anchored in the scrotum with the procedure being completed by closing the abdominal and scrotum incisions. This is a particularly effective surgical procedure since the tunneller is moved in a single direction only entering the first incision in the abdominal cavity and exiting through the incision in the scrotum with the tunnel so formed allowing the testis to be repositioned. The tunneller of the present invention is particularly suitable for this surgical procedure since the tunnelling head is attachably/detachably mounted at the end of the tunneller so that the tunnel can be formed by an appropriately sized tunneller head selected from a group of different size heads corresponding to different size testis thereby to correctly

size the tunnel with respect to the testis to be moved therethrough.

Preferably the attachment means is capable of being secured to the testicle to be moved by means of a surgical stitch. It is sufficient to anchor the testis to the end of the tunneller opposite the tunneller head and this may conveniently be implemented during the surgical procedure by means of a stitch which engages a suitable feature on the end of the tunneller. The attachment means may comprise a toroidal or part toroidal element for holding the stitch. A toroidal or ring shaped element conveniently enables the stitch to be anchored to the end of the tunneller in a reliable manner.

The attachment means may comprise a device suitable for engagement with the testis to be moved so as to fix the testis with respect to the end of the tunneller, this may include any grasping type instrument including for example forceps or forcep type surgical instruments.

Preferably the attachment means is attachably/detachably mounted on the end of the tunneller body so that for instance a removable handle portion may be attached to the end of the tunneller body during the initial procedure of inserting the tunneller and forming the subcutaneous tunnel and then removed for attachment of the testis to the attachment means at the end of the body which may be integral with the tunneller body or subsequently attached thereto. The attachment means for example may be connected to the end of the tunneller body by a threaded interengagement such as a screw thread or other securing means. In the same way the tunneller head may be

connected to the opposite end of the tunneller body by a similar threaded interengagement.

The invention also comprehends a uni-directional orchidopexy tunneller. In this respect it is to be understood that the term "uni-directional" refers to the one direction of movement of the tunneller within the patient's body. The invention also comprehends a kit of parts for a tunneller as described with reference to the above aspects of the invention.

An embodiment of the present invention will now be more particularly described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a schematic view of the component parts of an orchidopexy surgical tunneller according to one arrangement of the present invention;

Figure 2 is a schematic representation of the different size tunneller heads corresponding to different size testis;

Figures 3-7 show various stages of an orchidopexy surgical procedure using a surgical tunneller instrument according to an arrangement of the present invention.

Referring to Figure 1 an orchidopexy tunneller 10 for use in orchidopexy surgery comprises elongate body element 12 in the form of an arcuate rod the ends of which are provided with internal threads for connection at one end with a tunneller head 14 and at the other with a testis attachment means in the form of a toroidal element 16. The tunneller head and toroidal element 16 are both provided with external threaded

portions for connection with the elongate body element 12. The threaded interengagement connection of the tunneller both the tunneller head and testis attachment ring provides for attachable/detachable mounting of the tunneller head and ring to the elongate body. This allows the tunneller head to be selected from a set of different sides heads each corresponding to a different size of testis (see Figure 2) so that an appropriate size head may be attached to the end of the tunneller body as required. The threaded connection at the other end of the tunneller body readily enables the ring element 16 to be removed and interchanged with a handle portion 18, also having an external threaded portion, for improved manipulation of the tunneller during the subcutaneous tunnelling procedure.

The ring element 16 readily enables the testis to be moved by the tunneller to be attached to the end of the tunnel by means of a surgical stitch looped around the ring element 16. The threaded connection also enables the ring 16 to be replaced by a grasping type tool 20 also having an external thread for attachment to the end of the tunneller body. The grasping element 20 may comprise any suitably modified surgical instrument capable of firmly holding the testis to be moved by the tunneller.

Referring now to Figures 3-7, in Figure 3 the first step in the orchidopexy procedure is shown where an incision 30 is made in the abdominal wall 32 in the region of the undescended testis with the testis 34 located externally of the patient's body. In the drawing of Figure 3 the tunneller body and tunneller head are shown on top of the patient's body lying in a position corresponding to the subcutaneous tunnel to be formed by the tunneller. The area 36 represents a surgical sheet covering the patient's

body not involved in the surgical procedure. Figure 4 shows the tunneller inserted in the incision 30 with the tunneller head moved to a position within the scrotum 38 to form a subcutaneous scrotal pouch (dartos pouch) 40. In Figure 5 a second incision 42 is formed in the scrotum in the region of the tunneller head so that the tunneller may be pulled through the patient's body with the undescended testis 34 attached to the other end of the tunneller by means of a surgical stitch as shown in the drawings of Figures 6 and 7. The surgical procedure being completed by releasing the testis from the end of the tunneller and anchoring it to the scrotum prior to closing the incisions previously formed.

Although aspects of the invention have been described with reference to the embodiments shown in the accompanying drawings it is to be understood that the invention is not limited to these precise embodiments and that various changes and modifications may be effected without further inventive skill and effort.

CLAIMS

1. An orchidopexy tunneller comprising an elongate body having a connection means at a one end thereof for connecting an attachable/detachable tunnelling head selected from a set of different sized heads each corresponding to a different testicle size, and attachment means at the opposite end thereof for attachment with a testicle to be repositioned in the human body by the said tunneller during orchidopexy surgery.

2. A tunneller as claimed in Claim 1 wherein the said attachment means is capable of being secured to the said testicle to be moved by means of a surgical stitch.

3. A tunneller as claimed in Claim 2 wherein the said attachment means comprises a torodial or part torodial element for holding the said stitch.

4. A tunneller as claimed in any preceding claim wherein the said attachment means comprises a testicle engagement means capable of fixing the said testicle with respect to the said tunneller.

5. A tunneller as claimed in Claim 4 wherein the said engagement means comprises forceps or a forceps type instrument.

6. A tunneller as claimed in any preceding claim wherein the attachment means

is attachably/detachably mounted on the said end of the elongate body.

7. A tunneller as claimed in Claim 6 wherein the said attachment means is connected to the end of the elongate body by threaded inter-engagement.

8. A tunneller as claimed in any preceding claim wherein the said tunneller head connection means comprises a threaded inter-engagement.

9. An orchidopexy surgical tunneller.

10. A kit of parts for an orchidopexy tunneller according to any preceding claim.

11. A tunneller substantially as hereinbefore described and/or with reference to the accompanying drawings.

Application No: GB 0220821.3
Claims searched: 1-11

Examiner: David J Evans
Date of search: 28 February 2003

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance	
X, Y	X = 1-4, 6 & 9 at least. Y = 5	GB 1546172 A	(HUBRICH) especially see figs 1, 2 & 2b, page 1 lines 33-45 & 62-65 and page 2 lines 43-53.
X	9 at least.	SU 1801374 A	(UZB) refer to abstract translation.
X	9 at least.	SU 1337066 A	(SLEPTSOV) refer to fig 3 and abstract translation.
X	9 at least.	RU 2146880 C	(LONSHAKOV) see abstract translation.
X	9 at least.	SU 664640 A	(GORKI) see abstract translation.
Y	5	US 5192298 A	(SMITH) in particular refer to fig 5f.

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC[V]:

A5R

Worldwide search of patent documents classified in the following areas of the IPC[7]:

A61B, A61M

The following online and other databases have been used in the preparation of this search report:

Online: EPODOC, WPI & PAJ.